CLAIMS

1. A heat exchanger comprising a plurality of flat hollow bodies arranged one above another in parallel at a spacing and extending in a left-right direction, a communication member disposed between left end portions of each adjacent pair of flat hollow bodies for holding the adjacent pair of flat hollow bodies in communication with each other therethrough, a spacer in the form of a block and disposed between right end portions of each adjacent pair of flat hollow bodies, each of the flat hollow bodies comprises an upper and a lower flat wall elongated in the left-right direction, a peripheral wall interconnecting the upper and lower walls at peripheral edges thereof, and a partition wall dividing interior of the hollow body into two straight channels extending in the left-right direction, a left end portion of each of the upper and lower walls being provided respectively at front and rear areas thereof on opposite sides of the partition wall with two through holes spaced apart in a front-rear direction for causing the respective channels to communicate with the communication member therethrough, the partition wall having a right end portion cut off to hold the two channels in communication with each other therethrough, the spacer being provided with a bore extending therethrough in the front-rear direction, the spacer being positioned in corresponding relation with the cutoff portion of the partition wall of the flat hollow body.

2. A heat exchanger according to claim 1 wherein the spacer has a left-to-right width larger than the length of the cutoff

portion of the partition wall in the left-right direction.

3. A heat exchanger according to claim 1 wherein the spacer has a plurality of bores extending therethrough in the front-rear direction and arranged side by side in the left-right direction.

4. A heat exchanger according to claim 1 wherein the spacer has an inner peripheral surface defining the bore and provided with a plurality of ridges and/or furrows extending longitudinally of the bore.

5. A heat exchanger according to claim 1 wherein each of the flat hollow bodies comprises upper and lower two flat plates elongated in the left-right direction and arranged one above the other at a spacing, and a channel forming body disposed between and brazed to the two flat plates, the channel forming body comprising two straight side bars arranged between the upper and lower flat plates respectively at front and rear side edges thereof and extending in the left-right direction, an intermediate bar positioned between and spaced from the two side bars and extending in the left-right direction, two heat transfer area increasing portions formed between the intermediate bar and the respective side bars integrally therewith and provided at an intermediate portion of the height of the bars, and two end bars extending forwardly or rearwardly inward respectively from left ends of the side bars integral therewith and having inner ends bearing on and brazed to a left end of the intermediate bar respectively at front and rear side faces thereof, the intermediate bar having a cutoff right end portion, the two heat transfer area increasing portions

each having a cutoff left end portion, a left end portion of each of the upper and lower flat plates having two through holes formed respectively in front and rear areas thereof on opposite sides of the intermediate bar, the upper and lower flat plates providing the upper and lower walls respectively, the upper and lower flat plates having respective right end portions each bent toward the other, the bent end portions being lapped over and brazed to each other to provide a right wall portion of the peripheral wall, the two side bars of the channel forming body providing front and rear side wall portions of the peripheral wall, the end bars of the channel forming body providing a left wall portion of the peripheral wall.

6. A heat exchanger according to claim 5 wherein the upper and lower flat plates are each made of an aluminum brazing sheet, and a channel forming body comprises an aluminum extrudate.

7. An industrial machine comprising a heat exchanger according to any one of claims 1 to 6 and serving as an oil cooler.

8. An industrial machine comprising a heat exchanger according to any one of claims 1 to 6 and serving as an aftercooler.

9. A process for fabricating a heat exchanger according to claim 1 which is characterized by:

preparing channel forming blanks each comprising two straight side bars arranged as spaced apart in the front-rear direction and extending in the left-right direction, an intermediate bar positioned between and spaced from the two side bars and extending in the left-right direction, and two flat plate

portions formed between the intermediate bar and the respective side bars integrally therewith and provided at an intermediate portion of the height of the bars, pairs of upper and lower flat plates elongated in the left-right direction, communication members each having two through bores spaced apart in the front-rear direction and extending vertically, and spacers each having a bore extending therethrough in the front-rear direction,

making channel forming bodies from the respective blanks each by cutting off left and right opposite end portions of the intermediate bar of the blank, cutting off a left end portion of each of the flat plate portions of the blank over a length larger than the cutoff length of the left end portion of the intermediate bar, subjecting the two flat plate portions of the blank to press work to make heat transfer area increasing portions, and bending left end portions of the side bars of the blank leftwardly or rightwardly inward to cause inner ends of the side bars to bear respectively on front and rear side faces of the intermediate bar to form end bars,

bending right end portions of each pair of upper and lower flat plates toward each other to form bent portions and forming two through holes in a left end portion of each flat plate in areas thereof to be positioned on front and rear opposite sides of the intermediate bar,

making a plurality of combinations each comprising the resulting pair of upper and lower flat plates and the channel forming body disposed therebetween, arranging the combinations one above another in parallel at a spacing, providing each

of the communication members between left end portions of each adjacent pair of combinations so as to permit the two through bores to communicate with the respective through holes of each flat plate, providing each of the spacers between right end portions of each adjacent pair of combinations, and further positioning a fin between each adjacent pair of combinations between the communication member and the spacer, and

brazing each pair of upper and lower flat plates to the side bars, the intermediate bar and the end bars of the channel forming body between the pair of plates, the inner ends of the end bars to the intermediate bar, and the bent portions of each pair of flat plates to each other, and further brazing each flat plate to the communication member, the spacer and the fin which are adjacent thereto.

10. A process for fabricating a heat exchanger according to claim 9 wherein each of the flat plates is made of an aluminum brazing sheet, and each of the communication members, the spacers and the channel forming blanks is made of an aluminum extrudate, the fin being made from a thin aluminum plate, the brazing being performed with a brazing material released from the flat plates on melting.

11. A process for fabricating a heat exchanger according to claim 9 wherein the spacers have a left-to-right width larger than the cutoff length of the right end portion of the intermediate bar of the channel forming blank in the left-right direction.

12. A process for fabricating a heat exchanger according to claim 9 wherein each of the spacers has a plurality of bores extending therethrough in the front-rear direction.

13. A process for fabricating a heat exchanger according to claim 9 wherein each of the spacers has an inner peripheral surface defining the bore and provided with a plurality of ridges and/or furrows extending longitudinally of the bore.